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Att: Vu, Ngoc Yen T

As you requested in your Office Communication of July 22, 2010 (copy of cover page attached), I have expanded the specification disclosure paragraphs 25 to 45 make more clear the description relating to all figures but particularly figures 1, 3 and 6-8 as you requested. I believe this expansion as per the attached document is the appropriately correction and it also retains the same paragraph count of the original application.

I have also included attached on a separate paper the names and addresses of each inventor including their postal zip code as you requested.

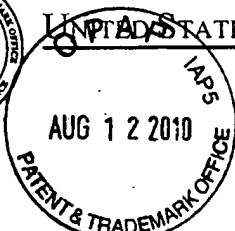
Thank you for your very kind continuing help with this application and please let me know if you need any further information.

Sincerely,

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.



## DETAILED DESCRIPTION OF THE INVENTION

25. The descriptions that follow are provided so as to enable any person skilled in the art to make and use the invention, and sets forth some modes presently contemplated by the inventors of carrying out their invention. Various modifications, however, will remain readily apparent to those skilled in the art, since the generic principles of the present invention have been defined herein.

26. The Camera System means, illustrated in Figure 1., of this invention incorporates the use of, but not limited to, sensors such as a surveillance video camera means with incorporated local controller, 101, with forward, 102, and backward listening audio detection capability, 103, and video detection viewing capability, 104, functions and the camera system could but not necessarily have, full pan, tilt and zoom computer controlled motion for monitoring of a given scene, situation, place, thing, persons or environment. The Camera System means can provide the camera means, 101, with communications means for communications means of hardwired, 105, or wirelessly connected, 106, to a central processing and security systems/ facility, which may be located at the facility where the surveillance is occurring or at a remote location, either of which, with incorporated central controller, 107, to storage systems, connecting to databases, connecting to fuzzy logic processors, and/ or connecting to mobile portable cellular or FM radio phones, 108, or connecting to PC facilities and connecting to personal data assistants (PDA's such as "Palm" or "Pocket PC" and the like), 109. Intelligent analysis and fuzzy logic functions means may be integrated into the camera means or any of the so connected or connectable facilities forming the complete Camera System means of figure 5.

27. In a preferred embodiment, camera system means illustrated in Figure 1., of this invention could be observing a person or persons and their activity, 110, with a plurality of sensors such as but not limited to audio and video so that the intelligent analysis means can interpret those person, persons and/ or activities for potential threat and can record the speech and facial observations for identification using but not limited to comparisons to databases of audio, visual and speech and text information to which the facilities are connected via the Internet WEB, 111, or by hardwired land, 112, or telephonic or wireless links, 108 and 109.

28. A unique aspect of the Camera System means of this invention illustrated in Figure 1., is its ability to learn from the data collected from these observations and from data in and collected for the comparison databases means. These database means and facilities, whether incorporated into the camera means or located elsewhere, can include local and remote databases including but not limited to: the Multi-Media, 113, such as print including news papers, radio and TV; the Government, 114, such as criminal activity/ conviction or drivers license identification or terrorist activity; and the Associated data systems, 115, such as medical/ mental health, or incarceration, or education, and the like. Health information, accessed by the Camera System means, in particular could be critical in understanding the actions of persons to recognized the differences between drunkenness, heart attack, diabetic coma, epileptic seizure and the like. These databases and their information as accessed by the Camera System means can become as part of the Camera System means and can be linked via the WEB, hardwired, telephony or wireless means. Learning by the Camera System means by comparison of the observations it makes with video and audio detection to the information available in these databases, can result from the Camera System means making a plurality of analyses, conducted by the Intelligent Camera System means in Figure 5., 503, such as but not limited to the Intelligent

Camera System use of fuzzy logic processor, 501, and resulting comparisons with information stored in the general facility databases, 502, including but not limited to previous visual data such as faces of persons, and/ or audio data such as speech, and/ or text data such as key words or phrases. Such comparisons from which the system using fuzzy logic matches those aspects of the current observations, the system can proceed to learn that the person being observed has, for example, used the word "Bomb" but because, for example, the person's actions in reference to a database of actions can not be considered a threat and, for example, the person's face can not be recognized in reference to a database of faces, hence the fuzzy logic processor, 501, of the Camera System means in this example, from such learning, decides to save the new face and speech and key word "bomb" for future comparison. The Camera System means so learns that this person currently under surveillance observation is a person for the Camera System means to "watch out for" in the future and at the same time it decides to continue current observations of this person, in case further data matching to the databases indicates a true or potential threat exists or could occur.

29. A plurality of threats or threatening conditions can be detected and responded to by this Camera System means including but not limited to terrorist threats, personal threats physical or otherwise, telephony harassment, unauthorized entry or exit, dishonesty and fraudulence such as misuse of credit cards or smart cards or proximity identification systems and the like threats. To all of these potential conditions, actions or people, it is the observation, the data collection, the database structures and storing of information for comparisons and the fuzzy logic analyses and interpretation from any, some, or all data from the databases or from observations of persons, places and things and the resulting recognition of their meaning and possibility of threat that this invention reveals.

30. The Intelligent Camera system Means of Figure 5., that incorporates a fuzzy logic processor, 501, means of this Camera System means will include a plurality of computer analyses techniques and technologies, software, firmware and hardware methods and designs including but not limited to recording and storage and retrieval of data, video pattern recognition, facial recognition, body action recognition, stress analysis of facial appearance and movement, stress analysis of body appearance and movement, emotional condition stress analysis from facial and/ or speech and/ or body action, surrounding environment condition assessment, voice stress analysis, voice recognition, voice speech recognition to text, lip reading recognition of speech and conversion to text, deep extraction of information and meaning from text or multi-media information, and the like.

31. Many of these techniques and technologies have been noted in the background to this invention, but what is unique in this invention is that we reveal a Camera System means for the combination of these into one integrated system: a "Voice, Lip-reading, Face and Emotion Stress Analysis, Fuzzy Logic Intelligent Camera System" for intelligent analysis and automated learning and decision analysis for the detection and understanding of a threat or potential threat by a person or persons or animals or objects, or by their actions, or by their appearance or by their speech or any combination of these.

32. An illustrated example could be a threat to people and/ or property.

Referring to Figure 2, we use the application of this invention to the sports arena environment and more specifically addressing the security problem of sports fans posing a potential threat to the sports athletes, other fans and persons at the arena or the arena itself, which application of our invention we refer to as a process of scanning the sports fans. This could include but not limited to throwing objects at athletes or fans or others at the arena; fans going onto the athletic field and interfering with the

athletes or activities on the field; fans or persons being loud and/ or abusive; fans or persons being intoxicated; fans or persons being a threat to their own well-being and the like. Figure 2, shows the Toronto, Ontario, "SkyDome" as the example arena in which we have indicated six surveillance audio-video camera means, 201, (1 to 6) located at field level and two more, 202, (7 & 8) at the 200 level. Also indicated on the concourse level, 203, are 21 usher/ security personnel (a) through (u), located near the entrance to each aisle of the field level seats as well as locations, 204, of 2 beer purchasing counters. An optional additional 15 cameras, 205, G-1 through G15 could be positioned at each of the entrance gates to the arena.

33. In this example of a preferred embodiment of the Camera System means, illustrated in Figure 2., the six camera means, 201, with full pan, tilt and zoom functions have the software and hardware means to continuously scan the fans in the stands and the system has the analysis and database comparison information means in order to recognize and detect sounds, speech, actions or activities of the fans that may indicate a threat or threats such as noted. The camera means having forward listening and backward listening microphone means, 102 and 103, and through the Intelligent Camera System means fuzzy logic capability illustrated in Figure 5., 501, can access and utilize the Camera Means Information logic indicated in Figure 6, for camera control means, 607, with analyses to effect the camera means to point in the direction from which the microphones detected sound that the fuzzy logic decided requires video surveillance, can be so pointed by the Camera System means. The camera means so directed views the area from which the sound was or may still be emanating and further fuzzy logic analyzes the images and the sounds being observed and with the analysis means, compares them, through the communication linkages, illustrated in Figure 1., 111 or 112, to information in the databases from which the camera system means fuzzy

logic can analyze the observed and database accessed information and can assess possible threat.

34. Many possible comparisons by the Camera System means fuzzy logic could occur, such as but not limited to: a person being observed, 110, by the video camera of the Camera System means of Figure 1, and the analyses of that video data by the Intelligent Camera System means of Figure 5. using the fuzzy logic of the Camera Means Information of Figure 6., 601, is matched by the Camera Means Information analysis, 602, to the image of a person guilty of assault recorded in one of the databases, 603; or with similar steps of logic for the case of audio data observations of the person, the language of a person being observed is, or could be interpreted as emotionally angry or abusive or intoxicated or a combination of these; or with the video data analyses, the actions of a person being observed indicate likelihood of the person attempting to throw an object at an athlete on the athletic field; or the actions of a person being observed indicate the likelihood of the person attempting to enter the athletic field or such like. If and when Camera System means fuzzy logic incorporated in the fuzzy logic processor illustrated in Figure 5., 501, accessing the logic of the Camera Means Information of Figure 6., finds a match that is a threat, 604, then at any facility employing the Camera System Mean it can inform the security facility, 605, at any such facility in this example at the arena such as at the Central Facility indicated in Figure 1., 107, or the security personnel via wireless communications, 108 or 109, for appropriate actions, that the Camera Means Information fuzzy logic indicated in Figure 6., decides, 606, to be taken.

35. Alcohol abuse and intoxication are well known as a related contributing factor to fan-caused disruption and threat at athletic arenas and for such, the Camera System means can implement a unique sensor, data



collection and database logging means. We reveal the new idea of tracking tickets of fans in the venue such as a sports arena and in so tracking the tickets we reveal a method for also tracking the purchase of alcohol. It is also contemplated in this invention, that a new "Visual Response Measure" can be established and used to identify the that a person is drunk, intoxicated or impaired by alcohol or drugs and that standard sets of levels of such intoxication or impairment can be identified and used to classify a person's level of intoxication or impairment.

36. Tracking of tickets can be done using the well known magnetic strip recording/ data storage means indicated in Figure 3., 301, used with credit or debit cards, or parking lot entrance/ exit tickets and the like, or smart cards, or proximity cards, and incorporating one or more of these technologies into the physical tickets to the arena, 302. Recorded on this recording/ data storage means could be information such as but not limited to the seat or location allowed fan access, the date and performance being attended, the cost of the ticket, sales location, method of payment for the ticket and the like. In the case of seasons ticket holders, the seat location information could be preloaded into the databases of the Camera System means ahead of actual attendance at the arena; the holder's identification information could be stored for future reference by the Camera System means as well. The recording means on the ticket could also be a printed means, such as bar code or magnetic printing and the like, for which the reading/ writing means would be designed and implemented also to read and write these.

37. Usually the fan retains a portion of the ticket as proof of paid entry and for display to security people to access the fan's seat or location during his attendance at the arena. The ticket recording/ data storage means could be located only on the ticket portion retained by the fan, 302, or could also could be located on the portion retained by the arena. At the entry gates

to the arena the ticket reading logic as illustrated in Figure 8., 809, located at said gates as illustrated in Figure 2, 205, using the reading means illustrated in Figure 3., 303 and fuzzy logic of the Camera Means Information accessing and analyzing said reading as illustrated in Figure 6, 608, could be located to read, 609, and store with the central facility, 304 noted in Figure 3. and the reader data analysis fuzzy logic interpretation of said reading, illustrated in logic of Figure 8., 810, communicated via using wired or wireless communications, illustrated in Figure 3., 305, the data recorded on the ticket as indication of entrance, and as communicated to the Camera Means Information system logic indicated in Figure 6., 608, 609, 610 and 611, of a fan holding that ticket. Either the fan or security personnel, operating the reader system indicated in Figure 3., the security personnel or the fan, 306, could place the ticket into the reading means and retrieve it following its being read and the fan could proceed to enter the arena taking his portion of the ticket with him. If the ticket recording/ data storage means is located just on the ticket portion to be retained by the fan, then this portion or the whole ticket would need to be placed in the reading means and the fan would have to wait for the reading task to be completed before entering the arena with his portion of the ticket removed from that portion retained by the arena. It is also possible that the reading means, indicated in Figure 3., 303, could incorporate a writing means, 307, for the Camera System means to automatically write on the ticket recording/ data storage means, 308, additional information such as but not limited to gate and time of entry. It would be possible also to include a numeric input key pad on the reading means, 303, to enter information, which subsequently is communicated to the Camera Means Information system of Figure 6., 611, manually for the Camera System means to write the additional information onto the recording/ data storage means.

38. It is not necessary for the arena to retain a ticket portion or even for the ticket to be separable into portions; however, for the following ticket tracking use in monitoring and controlling alcohol use, it is necessary that the ticket recording means at least be located on the ticket or ticket portion retained by the fan. If a separable ticket is used, the fan or the arena personnel at the entrance gate, could have the ticket information read into the reader of Figure 3., 303, communicated to the Camera Means Information fuzzy logic system of Figure 7., 709, could separate the ticket portions at the entrance gate and only that portion retained by the arena need be read, and communicated to the fuzzy logic system of Figure 7., 710, thereby allowing the fan to proceed into the arena with his portion of the ticket and without waiting for the reading means to complete its task, thereby saving time and speeding up entrance of fans. However, if it is desired to have the writing means add data to the recording/ data storage means on the ticket portion retained by the fan, it would be necessary to have that fan's portion placed in the reading and writing means and to be written upon. If the fan does the placing of the ticket or ticket portion into the reading means and the gate means could be automated to allow entry if the ticket is accepted by reading means, it is possible that arena entry could be "self serve" and the need for security personnel on every gate could be reduced or eliminated resulting in significant cost savings to the arena. This ticket reading method also clearly provides significant statistical data information gathering function, of the fuzzy logic analysis system indicated in Figure 7., 711, capability at the central facility relating to arena management and operations. For season's ticket holders, their identification information as well as seat location could be automatically entered into the Camera System databases at ticket purchase thereby enriching the data information.

39. If ticket tracking information is combined with the camera means, and ticket reading function located at the arena entry gates such as Gate 9

indicated in Figure 2., 205, and, the Camera System Means indicated in Figure 1., 101 and in Figure 3., 309, observing the fan upon entrance, then the fuzzy logic system indicated in the Camera Means Information system of Figure 7., 712, together they could provide a major source of information, analyzed by the Ticket Card Reader Means Information system indicated in Figure 8., 811, for recording and storing these data from the card reader using the fuzzy logic of the Ticket Card Reader Means Information system, 812, into the security fuzzy logic analysis, 813, database of the Camera System means as a function of the Ticket Card Reader Means Information system fuzzy logic, 814. If the ticket reading means, 303, illustrated in Figure 3., also has a writing means, 307, as proposed above, data regarding the camera means observations could also be added to the information recorded by the Camera Means Information system illustrated in Figure 7., 711, on the ticket recording/ data means, printing on the fan's ticket indicated in Figure 3., 308, such as but not limited to identification for the images recorded by the camera means viewing the fan at the time of entering the arena via the gate being viewed, or writing, and recording these audio and video and ticket read data into a database for future reference, 713, including video data recording an actual image of the fan so recorded on the recording/ data storage means, or the like.

40. With ticket tracking identification information such as the fan's seat location and the date and the performance at which the fan is attending recorded on the ticket recording/ data storage means, a reading means, as illustrated in Figure 3., 303, and if the reading and writing means is equipped with a visual display means, 310, and such reading and writing means is also installed, for example, at all alcohol vending areas, and the said fan's ticket is also so read at these vending areas, then the fuzzy logic system of the Ticket/Card Reading Means Information system indicated in Figure 8., 801, like the beer counters illustrated in the arena

shown in Figure 2., 204, it could be arranged such that the ticket of the alcohol purchaser must first be read, and that information read from the ticket communicated to the Ticket/ Card Reader Means Information system indicated in Figure 8., 802, by the reading means and information so read and stored by the fuzzy logic of the Ticket/ Card Reader Means Information system, 803, on one of the databases of the Camera System means before each and every purchase. The fuzzy logic of the Camera System means at the central facilities being part of the Camera Means Information system illustrated in Figure 6., 612, would then add this current alcohol sale to the database information on this fan's alcohol purchases by the fuzzy logic of the Ticket/ Card Reader Means Information system of Figure 8., 804, such that the fuzzy logic system could request to the total of all previous such sales so recorded that day as accounted to this said ticket and only if that total so computed, 805, is less than a preset amount comparison made by the fuzzy logic of the Camera Means Information system indicated in Figure 6., 613, will the Camera System means display on the visual display unit located at the said alcohol sales location illustrated in Figure 8., 806, indicate approval for alcohol purchase if the total to that time is less than the preset limit and before the purchase is allowed to proceed by the bar tender serving the fan, 807, and if said limit is met or exceeded, the display would indicate via the fuzzy logic of the Camera Means Information system illustrated in Figure 6., 614, no sale is to be allowed to that ticket holder and would be so displayed on the ticket reading and display system illustrated in Figure 3., 311, such as "no sale" and/or a light or lights incorporated on the said display system, 312, such as a green illumination indicating "sale approved" and a red illumination indicating "no sale" or the like as analyzed and decided by the fuzzy logic of the Ticket/ Card Reader Means Information system illustrated in Figure 8., 808. This description is intended to be for the purchase of alcoholic beverages and display means could also include an audible means for indication to the seller, or also

could include a loud speaker means incorporated into the ticket/ card reading system indicated in Figure 3., 313, to simulate the equivalent of the bar tender telling the fan patron (or patrons) he is "cut off" from all further drinks. This ticket tracking process, although described here for alcohol related purchases, is not limited to such and could apply to any and all activities of the fan while in the arena. The ticket reading means indicated in Figure 3., could also include a writing means either electronically recording on the storage means of the ticket or a printing means to print a visible mark such as "Void", illustrated in Figure 3., 314, indicating no further alcoholic sales to anyone displaying that ticket. Policing drinking at athletic events with ticket tracking processes could significantly reduce fan rowdiness, drunkenness and threats, and refusing to serve fans is one effective way to minimize this threat.

41. The camera means noted earlier in the SkyDome arena at the 200 level, illustrated in Figure 2., 202 and the video camera system illustrated in Figure 1., 101, communicating said video surveillance of the said fan to the Camera Means Information system fuzzy logic analyses illustrated in Figure 7., 701, camera means, Camera Means Information system logic of Figure 7. & Ticket/ Card Reader Means Information system reading of the fan's ticket information for analyses indicated in Figure 8., equipped with a zoom means sufficient to view any seat in the arena, could be combined with the 100 level camera means could communicate said video data observation to the central Facility Camera Means Information system logic and analyses processes indicated in Figure 7., 702, such that if the 100 level camera means indicated to the Camera System means that a security risk or threat exists, then the fuzzy logic analyses of the Camera Means Information system 703, of the Camera System means could direct one or more of the 200 level camera means resulting from the threat analyses of these video data, to then using the fuzzy logic, 704, of the Camera Means Information system could direct the said level 200 camera

means system to zoom in to view the area indicated to provide another view of the scene or vice versa. This functionality could be combined with the ticket tracking function and the 200 level camera means fuzzy logic of the Camera Means Information system direct the said cameras so that they could zoom as determined by said fuzzy logic, 705, in to view on the very seat for which that ticket was purchased. Additionally, these 200 level camera means can provide discreet non-intrusive observation of the entire arena to consider if any threat has been detected at any location the cameras view in the entire arena implementing the fuzzy logic indicated in Figure 7., 706. However, clearly every arena will have its own particular construction and layout and the use of "200 level" or "100 level" camera means is only illustrative of placement of camera means for more distant and for more close up viewing and the numbers of camera means and sensors and their locations would be selected and arranged appropriate to the arena in which they are used.

42. The Camera System means of this invention is intended as a tool to assist security personnel and systems to automatically detect potential threats as determined by the fuzzy logic of the Camera Means Information system illustrated in Figure 7., 707, and to report these to the security systems and personnel, 708, as appropriate. The actions of persons resulting from drunkenness include but are not limited to difficulty in walking due to drunken condition as well as aggressive behavior such as loud talking and yelling and often accompanied with swearing, and are just some of the reactions that the Camera System means can be programmed to detect and that it can learn to observe.

43. The sports arena is just one of a plurality of applications to which the Camera System means revealed in this invention that anyone skilled in the art of security systems and their implementation can immediately recognize and understand by this invention. Another example of a

preferred embodiment is use in border security and security of regions, areas, compounds and the like. Figure 4 illustrates an application to a USA border crossing in which invalid entry, smuggling, terrorist activity or movement are just some of the threats to which the Camera System means of this invention could provide a tool to assist security personnel, border guards and security systems.

44. Camera means including audio and video observations and recordings are illustrated in Figure 4, as gantry mounted units, 401, 402, and as a post mounted unit, 403, which are arranged to observe the actions, speech, emotions, and the like of the occupants of cars approaching and at the guard kiosk while the Camera System means automatically analyzes the data recorded. As described earlier the Camera System means searches its databases and central facilities including stress analysis, lie detection, emotional stress, deep text extraction and the like to determine if a threat or potential threat or criminal action or terrorist or other undesirable is present. If such a threat or potential is detected the Camera System means immediately informs the security border guard and the security systems and personnel for appropriate actions to be taken.

45. In this illustration, camera means unit, 401, is observing the vehicle at the guard kiosk, and is viewing the occupants recording video images and sounds and speech of the occupants and the guard. Camera means, 402, is recording the similar information observing the occupants of the next vehicle waiting to approach the security border guard; however, this camera means will attempt to observe the actions of the occupants and their "private" discussions and actions prior to addressing the guard. Often discussion between occupants may be very revealing of the intentions to carry out threatening or illegal actions. Viewing the next vehicle waiting by a camera means at some distance from the vehicle can also permit identification of the vehicle type and license plate, and camera



means, 402, could also be located to view the rear of the waiting vehicle and the rear license plate. Camera means, 403, could be located very close to the waiting vehicle to more closely view the occupants and if possible hear their conversation, and if not audibly hearing their speech, then possibly using the Lip Reading observations and analyses revealed in this invention to provide the Camera System means with the data needed for recognition of text, permitting deep extraction of words, phrases and meanings related to threats or potential threats.

## Patent Application 10/626,888

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